

Claims

- [c1] 1. A sealing probe, comprising:
- (A) a hollow, sealant-releasing section, such section having:
- (i) a plurality of apertures disposed about an outer wall of such section, such apertures passing through the outer wall from a hollow, interior region within such section to a region external to the sealant-releasing section; and
 - (ii) an entrance adjacent a top portion of the sealant section for receiving a sealant and passing such sealant to the hollow, interior region and then from the hollow, interior region, through the apertures, to the region external the sealant-releasing section;
- (B) a first seal disposed about an upper portion of the outer wall, such first seal extending beyond the outer surface of the sealant-releasing section; and
- (C) a second seal disposed adjacent to a lower portion of the outer wall.
- [c2] 2. The probe recited in claim 1 including a flexible tube connected to the entrance of the sealant-releasing section.
- [c3] 3. The probe recited in claim 1 wherein the first seal includes an O-ring.
- [c4] 4. The probe recited in claim 1 wherein the second seal includes an O-ring.
- [c5] 5. The probe recited in claim 1 wherein the second seal includes a hollow flexible tip connected to the lower portion of the sealant-releasing section, such hollow portion of the second seal being in communication with the hollow, interior region of the sealant-releasing section for receiving sealant from the hollow, interior region of the sealant-releasing section.
- [c6] 6. The probe recited in claim 1 wherein the second seal includes:
- a hollow flexible tip connected to the lower portion of the sealant-releasing section;
 - a piston disposed in the hollow flexible tip, such piston having a head in an upper region of the tip and a rod at a lower portion of the tip, such hollow portion of the tip being in communication with the hollow region of the sealant-releasing section for receiving sealant from the hollow region of the sealant-

releasing section, such received sealant forcing the head of the piston and the rod connected thereto into the flexible tip to inflate such tip.

- [c7] 7. The probe recited in claim 1 wherein:
the second seal includes a hollow flexible tip connected to the lower portion of the sealant-releasing section, such hollow portion of the tip being in communication with to the hollow, interior region of the sealant-releasing section for receiving sealant from the hollow region of the sealant-releasing section;
the sealing releasing section has a longitudinal axis;
the second seal has a longitudinal axis co-axial with the longitudinal axis of the sealing section; and
the tip is offset from the longitudinal axis of the second seal.
- [c8] 8. The probe recited in claim 5 wherein the second seal is a bellows.
- [c9] 9. The probe recited in claim 5 wherein the second seal is a diaphragm.
- [c10] 10. The probe recited in claim 9 wherein the diaphragm is disposed within hollow, interior region of the sealant-releasing section prior to such within hollow region of the sealant-releasing section receiving such sealant, such diaphragm being forced from within the hollow region of the sealant-releasing section to extend beyond the within hollow region of the sealant-releasing section.
- [c11] 11. The probe recited in claim 4 wherein the first seal includes an O-ring.
- [c12] 12. The probe recited in claim 5 wherein the first seal includes an O-ring.
- [c13] 13. The probe recited in claim 8 wherein the first seal includes an O-ring.
- [c14] 14. The probe recited in claim 9 wherein the first seal includes an O-ring.
- [c15] 15. The probe recited in claim 10 wherein the first seal includes an O-ring.
- [c16] 16. A sealing probe for injecting a sealant into a sealant-receiving region between a pair of members, each one of the members having an aperture in a surface thereon, an upper one of such members having a hole therethrough,

such hole terminating at the aperture therein, such aperture in the upper one of the members being in a lower surface of such upper one of the member, a lower one of the pair of members having the aperture therein in an upper surface thereof, such sealant-receiving region being between portions of the upper and lower members adjacent to the apertures in the pair of members, such probe comprising:

(A) a hollow, sealant-releasing section, for insertion into the hole in the upper member into at least a portion of the sealant-receiving region, such sealant-releasing section having:

- (i) a plurality of apertures disposed about an outer wall of such section, such apertures passing through the outer wall from a hollow region within such section to the sealant-receiving region; and
- (ii) an entrance adjacent a top portion of the sealant section for receiving a sealant and passing such sealant to the hollow region and then from the hollow region, through the apertures, to the region external the sealant-receiving region;

(B) a first seal disposed about an upper portion of the outer wall, such first seal extending beyond the outer surface of the sealant-releasing section to prevent sealant from passing beyond such first seal to portions of the hole above such first seal; and

(C) a second seal disposed adjacent to a lower portion of the outer wall to prevent sealant from passing into the aperture in the lower member.

[c17] 17. The probe recited in claim 16 including a flexible tube connected to the entrance of the sealant-releasing section for passing through the hole in the upper member.

[c18] 18. The probe recited in claim 16 wherein the first seal includes an O-ring.

[c19] 19. The probe recited in claim 18 wherein the second seal includes a rigid tip at the lower portion thereof for introduction into the aperture and wherein the second seal includes an O-ring.

[c20] 20. The probe recited in claim 16 wherein the second seal includes a hollow flexible tip connected to the lower portion of the sealant-releasing section, such

hollow portion being coupled to the hollow region of the sealant-releasing section for receiving sealant from the hollow region of the sealant-releasing section.

[c21] 21. The probe recited in claim 16 wherein the second seal includes:
a hollow flexible tip connected to the lower portion of the second seal;
a piston disposed in the hollow flexible tip, such piston having a head in an upper region thereof and a rod at a lower portion thereof, such hollow portion being coupled to the hollow region of the sealant-releasing section for receiving sealant from the hollow region of the sealant-releasing section, such received sealant forcing the head of the piston and the rod connected thereto into the flexible tip to inflate such tip.

[c22] 22. The probe recited in claim 16 wherein:
the second seal includes a hollow flexible tip connected to the lower portion of the sealant-releasing section, such hollow portion being coupled to the hollow region of the sealant-releasing section for receiving sealant from the hollow region of the sealant-releasing section;
the sealing releasing section has a longitudinal axis;
the second seal has a longitudinal axis co-axial with the longitudinal axis of the sealing section; and
the tip is offset from the longitudinal axis of the second seal for insertion into the aperture in the second member, such aperture in the second member being offset from the aperture in the first member.

[c23] 23. The probe recited in claim 22 wherein the second seal is a bellows.

[c24] 24. The probe recited in claim 22 wherein the second seal is a diaphragm.

[c25] 25. The probe recited in claim 24 wherein the diaphragm is disposed within hollow region of the sealant-releasing section prior to such within hollow region of the sealant-releasing section receiving such sealant, such diaphragm being forced from such to within hollow region of the sealant-releasing section to extend beyond the within hollow region of the sealant-releasing section.

[c26] 26. The probe recited in claim 22 wherein the first seal includes an O-ring.

- [c27] 27. The probe recited in claim 23 wherein the first seal includes an O-ring.
- [c28] 28. The probe recited in claim 24 wherein the first seal includes an O-ring.
- [c29] 29. The probe recited in claim 25 wherein the first seal includes an O-ring.
- [c30] 30. A sealing probe, comprising:
- (A) a hollow, sealant-releasing section, such section having:
- (i) a plurality of apertures disposed about an outer wall of such section, such apertures passing through the outer wall from a hollow region within such section to a region external to the sealant-releasing section; and
 - (ii) an entrance adjacent a top portion of the sealant section for receiving a sealant and passing such sealant to the hollow region and then from the hollow region, through the apertures, to the region external the sealant-releasing section;
 - (iii) such entrance having a groove disposed in a portion of a sidewall thereof;
- (B) a first seal disposed about an upper portion of the outer wall, such first seal extending beyond the outer surface of the sealant-releasing section;
- (C) a second seal disposed adjacent to a lower portion of the outer wall; and
- (D) an alignment plate having an aperture therein, such plate having: a key projecting into the aperture of the plate, such key being inserted into the groove.